Investigation of Parasympathetic Effects of Lavender Essential Oil in Humans

Haakon Robert Nelson  
*Liberty University*, hnelson1@liberty.edu

Rachel Ann Burkhart  
*Liberty University*, raburkhart1@liberty.edu

Daniel Morin  
*Liberty University*, dmorin@liberty.edu

Nicole Grace Weissenfluh  
*Liberty University*, ngweissenfluh@liberty.edu

Michael R. Korn  
*Liberty University*, mrkorn@liberty.edu

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Investigation of the Parasympathetic Effects of Lavender Essential Oil in Humans

Haakon Nelson, Daniel Morin, Nicole Weissenfluh, Rachel Burkhart and Michael R. Korn*
Department of Biology & Chemistry, Liberty University
Contact: mrrkorn@liberty.edu; phone: (434) 592-5456

Abstract

The purpose of this study was to investigate the claim that administration of lavender (Lavandula angustifolia) essential oil (topically, orally, and/or antidepressively) produces a sedative effect in human subjects. This investigation was designed by conducting experiments in two stages. Stage one focused primarily on determining the presence of therapeutic effects and the relative effectiveness of lavender in several application modalities. Stage two will proceed based on findings from stage one. If significant parasympathetic effects are observed in relation to one or more of the lavender oils investigated above, a more focused investigation will be conducted in stage two to ascertain the specific active chemical component(s) in the lavender essential oil.

Methods

Stage one will be a double-blind study involving separate trial groups. All subjects, regardless of group, will be allowed to sit in a position of comfort for ten minutes to allow the body to acclimate to a resting state. A pre-intervention set of vital signs (blood pressure, heart rate, and respiration) will be taken at this point to provide a baseline. After this ten minute non-invasive observation has been completed, the groups will receive lavender oils.

1. Lavender oil (1 drop, neat, applied topically to the wrists)
2. Lavender oil (3 drops, oral ingestion)
3. Lavender oil (3 drops, deep breaths through the nose, direct inhalation)

In order to prevent subjects in Group 1 from simultaneously inhaling the other oils, lavender oil will be used in a split administration (for comparison). For groups 4-6, 4 will be a placebo (a non-essential oil) to control for a specific agent. For groups 5-7, 5 and 6 will be tested to determine if any of the chemicals in lavender oil have the potential to affect cardiovascular parameters, which suggests parasympathetic cardiovascular activity.

For each subject in stage one, pre-intervention baseline readings were compared to post-intervention readings at 10 minute intervals. The results from the intervention groups will be compared to data from the control group to ascertain whether or not any parasympathetic responses were associated with each of the intervention modalities, and the data from these modalities that are found to produce a response will be further compared to assess their relative effectiveness to compare to each other.

Literature Review

In a three month double-blind clinical study, patients with a history of migraines were offered lavender-containing oral capsules. The group was found to suffer from markedly fewer and less severe headaches compared to the placebo control group [1].

In a study in which postoperative patients received lavender aromatherapy to mitigate anxiety after coronary artery bypass surgery, the researchers found no odour, a second experiment showed that ([8-10] increased O2 and CO2 uptake compared to the control group) [2].

Lavender aromatherapy was shown to improve the ability to sleep of middle-aged individuals [3].

Stage two of the experiment isolated samples of each major constituent compound will be procured and administered to the subjects in the same concentrations from individual oils. Purified for obtaining valid signs will be identical to stage one. The method of administration will be kept consistent, the lavender oil will be administered in the presence of inhalation, and the data from the intervention groups will be compared to data from the control group to ascertain whether or not any parasympathetic responses were associated with each of the intervention modalities, and the data from these modalities that are found to produce a response will be further compared to assess their relative effectiveness to compare to each other.

Effect of grapefruit and lavender essential oil scents on parasympathetic nerve activity and plasma glucose in rats

In the first set of experiments exploring the effects on the ANS of grapefruit and lavender scents, rats exposed to grapefruit oil demonstrated increased stimulation of the parasympathetic nerve of the pancreas, whereas the scent of lavender oil induced a decrease in activity of the nerve [Graph A and B below].

In rats with hyperglycemia caused by intravenous injection of 2-deoxy-D-glucose (2DG), the scent of grapefruit oil resulted in a greater increase in blood plasma glucose levels when compared to the control group (Graph A right). By contrast, the lavender oil scent was associated with a decrease in blood plasma glucose levels (Figure A above). Therefore, olfactory stimulation of grapefruit oil seems to heighten the hypoglycemic effect of 2DG on glucose levels, whereas olfactory stimulation of lavender oil counteracts the effect of 2DG.

References & Acknowledgments


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